

1-51. (Canceled) .

52. (Original) An expandable device comprising one or more multi-stable loops, the loop having a first state and a second state, the loop encompassing a first area in the first state and a second area in the second state, wherein the device is expanded by applying a force thereto.

53. (Original) The device of claim 52 comprising a first arcuate member having first and second ends and a second arcuate member having first and second ends,

the first end of the first member in communication with the first end of the second member, and

the second end of the first member in communication with the second end of the second member,

wherein the second member is more pliable than the first, the second member capable of assuming a first stable position and a second stable position.

54-72. (Canceled) .

73. (New) An expandable device for use in a passageway, comprising:

an expandable conduit formed of a wall having a plurality of slots therethrough with at least a portion of the plurality of slots having an arcuate shape when the expandable conduit is in a contracted state.

74. (New) The expandable device as recited in claim 73, wherein the arcuate shape transitions to an expanded shape as the expandable conduit is radially expanded.

75.(New) The expandable device as recited in claim 74, wherein the arcuate shape comprises a wave shape.

76.(New) The expandable device as recited in claim 73, further comprising a deformable material surrounding an outer surface of the expandable conduit.

77.(New) The expandable device as recited in claim 76, wherein the deformable material comprises an elastomeric material.

78.(New) The expandable device as recited in claim 74, wherein the plurality of slots are formed at least in part by a plurality of pivotal links.

79.(New) An apparatus for use in a passageway, comprising:

an expandable conduit configured for deployment within a passageway, the expandable conduit having a plurality of expandable cells that may be transitioned between a contracted state and an expanded state by application of a force directed radially outward,

wherein during expansion each expandable cell passes a transition point that allows the force to be decreased during transition to the expanded state.

80.(New) The apparatus as recited in claim 79, wherein the expandable conduit comprises a liner.

81.(New) The apparatus as recited in claim 79, wherein each expandable cell comprises a longitudinal strut and a flexible link.

82.(New) The apparatus as recited in claim 81, wherein each flexible link undergoes pivotal motion during expansion.

83.(New) The apparatus as recited in claim 81, wherein each flexible link is arcuate in form prior to expansion of the expandable conduits.

84.(New) The apparatus as recited in claim 81, wherein the force may be removed once each of the plurality of cells is moved past the transition point.

85.(New) An apparatus for use in a passageway, comprising:

an expandable device deployable in a passageway, the expandable device having a plurality of expandable cells, each expandable cell comprising a thin strut that is flexed between a contracted state and an expanded state without plastic deformation.

86.(New) The apparatus as recited in claim 85, wherein each thin strut is coupled to at least one thick strut that remains unflexed during transition of the thin strut from the contracted state to the expanded state.

87.(New) The apparatus as recited in claim 86, wherein each thin strut is pivotally coupled to at least one thick strut.

88.(New) The apparatus as recited in claim 85, wherein the expandable device remains at a substantially fixed axial length during transition from the contracted state to the expanded state.

89.(New) The apparatus as recited in claim 86, wherein the thickness ratio of the thick strut to the thin strut is at least 2:1.

90.(New) The apparatus as recited in claim 85, wherein the expandable device comprises a radially expandable tubular member.

91.(New) A method of applying a radial force against a surface of a passageway with an expandable device, comprising:

forming an expandable device with a plurality of cells expandable between a contracted state and an expanded state;

selecting the geometry of the cells such that the cells expand autonomously once expanded past a transition point; and

radially expanding the expandable device past the transition point and against a surface of the passageway.

92.(New) The method as recited in claim 91, wherein forming comprises expanding the plurality of cells without axial shortening of the expandable device.

93.(New) The method as recited in claim 91, wherein forming comprises forming the expandable device as a tubular member.

94.(New) The method as recited in claim 91, wherein forming comprises forming the expandable device as a liner.

95.(New) The method as recited in claim 91, wherein selecting comprises selecting a geometry that utilizes a combination of thick struts coupled to thin struts.

96.(New) An apparatus for use in a passageway, comprising:

an expandable bistable device configured for deployment proximate a passageway wall, the expandable bistable device having a plurality of bistable cells arranged in a generally tubular shape, each bistable cell comprising first and second arcuate members, the plurality of bistable cells being stable in a collapsed configuration and in an expanded configuration.

97.(New) The apparatus as recited in claim 96, wherein the first and second arcuate members of each bistable cell are connected to each other.

98.(New) The apparatus as recited in claim 97, wherein the collapsed configuration is a first generally tubular configuration and the expanded configuration is a second generally tubular configuration having a larger diameter than the first generally tubular configuration.

99.(New) The apparatus as recited in claim 96, further comprising a device able to transport the expandable bistable device to a desired location in the passageway.

100.(New) The apparatus as recited in claim 99, wherein the apparatus further comprises a deployment device able to initiate expansion of the expandable bistable device from its first generally tubular configuration to its second generally tubular configuration.

101.(New) The apparatus as recited in claim 97, wherein the first arcuate member and the second arcuate member each comprises a midpoint and two ends, and further wherein the first arcuate member is more flexible than the second arcuate member.

102.(New) The apparatus as recited in claim 101, wherein the first and second arcuate members are mechanically connected such that the second arcuate member hinders deformation of the first arcuate member.

103.(New) The apparatus as recited in claim 102, wherein the first arcuate member has two stable positions, the first stable position being where the first arcuate member mid-point is adjacent to the second arcuate member mid-point, the second stable position being where the first arcuate member mid-point is displaced from the second arcuate member mid-point to form a gap between the first arcuate member mid-point and the second arcuate member mid-point.

104.(New) The apparatus as recited in claim 96, wherein the second arcuate member has a greater thickness than the first arcuate member.

105.(New) The apparatus as recited in claim 96, wherein the thickness ratio of the second arcuate member to the first arcuate member is greater than approximately 3:1.

106.(New) The apparatus as recited in claim 96, wherein the bistable device further comprises a wrapping attached to the outer surface of the bistable device.

107.(New) The apparatus as recited in claim 106, wherein the wrapping comprises an expandable material.

108.(New) The apparatus as recited in claim 96, wherein the bistable device further comprises a deformable material attached to the outer surface of the bistable device.

110.(New) The apparatus as recited in claim 108, wherein the deformable material comprises an elastomer.

111.(New) The apparatus as recited in claim 107, wherein the wrapping is selected to be resistant to environmental conditions encountered in the passageway.

112.(New) The apparatus as recited in claim 98, wherein the bistable device in its second generally tubular configuration comprises a plurality of diameters.

113.(New) A method of stabilizing an unsupported section of a passageway, comprising:

providing an expandable bistable device having a generally tubular shape that comprises a plurality of bistable cells, each of the bistable cells comprising first and second arcuate members;

placing the bistable device at a position in the passageway while in a first stable state; and

radially expanding the bistable device to a second stable state having a generally tubular configuration without substantially reducing axial length.

114.(New) The method as recited in claim 113, further comprising attaching a wrapping to the outer surface of the bistable device.

115.(New) The method as recited in claim 114, wherein attaching comprises attaching an expandable material.

116.(New) The method as recited in claim 113, further comprising applying a deformable material to the outer surface of the bistable device.

117.(New) The method as recited in claim 116, wherein applying comprises applying an elastomeric material.

118.(New) The method as recited in claim 113, wherein radially expanding comprises expanding the bistable device to a plurality of final diameters.

119.(New) A method for installing a liner within a tubular passageway, comprising:

forming an expandable bistable device with a plurality of bistable cells, each of the bistable cells comprising first and second arcuate members, the expandable bistable device having a generally tubular shape;

surrounding the expandable bistable device with an expandable liner element attached to an outer surface of the



bistable device;

placing the expandable bistable device at a position within the tubular passageway while in a first stable state; and

expanding the expandable bistable device into a second stable state to hold the liner element against an inner diameter of the tubular passageway.

120.(New) The method as recited in claim 119, further comprising locating multiple bistable devices in the passageway such that the ends of the adjacent bistable devices overlap and form a continuation of the liner element against the inner diameter of the tubular passageway.

121.(New) The method as recited in claim 119, further comprising creating each bistable cell so that the first arcuate member comprises a thin strut and the second arcuate member is a thick strut.

122.(New) A method of isolating a portion of a passageway, comprising:

inserting within the passageway an expandable bistable device having a generally tubular shape formed by a plurality of bistable cells that permit the expandable bistable device to be selectively actuated between a contracted state and an expanded state, each of the bistable cells comprising first and second arcuate members; and

deploying the expandable bistable device to the expanded state to isolate a portion of the passageway.

123.(New) An apparatus for use in a passageway, comprising:

a tubular conduit having at least one bistable device, the bistable device comprising first and second arcuate members.

124.(New) The apparatus as recited in claim 123, wherein the bistable device comprises a plurality of bistable cells, the first and second arcuate members of each bistable cell being connected to each other at their ends, the device being stable in a first generally tubular configuration and a second generally tubular configuration, wherein the second generally tubular configuration has a larger diameter than the first generally tubular configuration.

125.(New) The apparatus as recited in claim 124, wherein the apparatus further comprises a device able to transport the apparatus to a location in the passageway.

126.(New) The apparatus as recited in claim 125, wherein the apparatus further comprises a deployment device that initiates the expansion of the bistable device.